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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Illuminated Indicator
Dials and Scales

We TELEFUNKEN PATENTVERWERTUNGS-
G.m.b.H. of Ulm/Donau, Elisabethenstrasse
3, Germany, a German company do hereby
declare the invention, for which we pray
5 that a patent may be granted to us, and
the method by which it is to be performed, to
be particularly described in and by the
following statement:—

This invention relates to illuminated indi-
cator dials and scales and though not limited
10 to its application thereto, is primarily in-
tended for and very suitable for use for,
the tuning dials of transistorised radio re-
ceivers.

15 It is well known to illuminate radio re-
ceiver and similar dials by mounting so-
called pea lamps behind a glass plate which
constitutes the dial and on which indicia
such as frequencies and/or transmitting
20 station names are inscribed. It is also well
known to floodlight such dials. Another
known proposal for obtaining an illuminated
dial is to use a so-called luminescent plate
which will light up on the application of a
25 predetermined alternating voltage and arrange
electrodes, one of which is transparent, so
that the whole area of the plate lights up,
and mask the plate by a stencil with indicia
cut in it. Although the power consumption
30 of such an arrangement is small it is still,
however, inconveniently large in some cases,
notably in the case of portable transistorised
radio receivers.

35 According to this invention an illuminated
dial has indicia which light up by electro-
luminescence provided by a layer of luminous
material which is placed between two
electrodes, the electrode towards the observer
40 consisting of a metal wire in the shape of
the required indicia and the arrangement
being such that an electrical field formed
between the two electrodes activates the

luminescent layer to light up to a width which
is greater than the diameter of the wire which
appears dark.

The invention is illustrated in and further
described with reference to the accompany-
ing drawing in which:—

Figure 1 is a simplified sectional view of
one form of luminous plate in accordance
50 with the present invention:

Figure 2 is a full view of a radio receiver
dial in accordance with the present invention,
and

Figure 3 shows a suitable circuit for
55 excitation.

Referring to Figure 1, the luminescent
plate comprises a layer 1 of luminous material
placed between an electrode 2 which is made
up of wires bent to the appropriate shapes
60 corresponding to the required indicia and a
layer electrode 3. The assembly so far de-
scribed is placed between a backing 4 and
a covering layer 5. The covering layer 5
is a transparent enamel or plastic layer; 65
and the supporting layer 4 is of
enamelled metal. If a suitable alternat-
ing voltage is applied between these
two electrodes 2 and 3 the layer of
luminous material 1 is excited by an electric
70 field (represented by lines 15 and 16) be-
tween the wire electrode 2 and the layer
electrode 3 over a greater width than the
diameter of the wire 2 so that the indicia
appear on the dial as dark strips, letters or
75 figures, as the case may be, outlined by
thin bright borders. The individual letters
and figures comprising the indicia are pre-
ferably suitably connected to a common
straight baseline wire running across the
80 dial.

Referring to Figure 2, the dial is traversed
by a dark pointer 11 which provides a
moving mark where it intersects the luminous

[Price 4s. 6d.]

strip. However by designing the wire electrode 2 to provide further marking such as 13 or words such as 14 a very clear and full dial display is obtained. Where there are several wavelengths tuning range scales with a number of pointers such as 11 and 12, by choosing differently coloured luminous materials for the different parts of the dial the different scales can have differently coloured illumination, the differently coloured parts having their own electrodes which are individually switched to the energising potential source by the normally provided range change switch of the receiver. In all cases the necessary connecting wires may be covered so as to be optically masked.

If a series of dials, to appear one at a time in the window of an escutcheon, for example, is required they may be mounted on a polygonal rotatable carrier so that only one at a time appears in the window and the electrode 3 of that dial for the time being may be capacitatively excited through a fixed insulating layer by a fixed further electrode (indicated at 6 in Figure 1) mounted in the appropriate position.

Referring to Figure 3, the circuit for excitation comprises a transistor 20 connected as an oscillator and the luminescent plate connected to constitute a parallel capacity 22 in the oscillatory circuit which also includes inductance 21. In one embodiment of the invention the normally provided local oscillator of a heterodyne receiver is used as the alternating voltage source for the dial arrangement. In an embodiment of this nature if there are a number of switchable wave ranges it is possible so to design the luminous plate portions for the different ranges that their capacities are suitable for use as fixed tuning capacities in the local oscillator circuits, variable tuning being effected by inductance variation. Of course in practice with such an arrangement additional trimming condensers will usually be provided. These may be constituted by adding small pieces of foil on the corresponding parts of the luminescent plate.

WHAT WE CLAIM IS:—

1. An illuminated dial having indicia which light up by electro-luminescence provided by a layer of luminous material which is placed between two electrodes, the electrode towards the observer consisting of a metal wire in the shape of the required indicia and the arrangement being such that an electrical field formed between the two electrodes activates the luminous layer to light up to a width which is greater than the diameter of the wire which appears dark.

2. A dial as claimed in claim 1 and wherein there is a plurality of groups of indicia each group having its own separately connectable electrodes whereby any one desired group may be caused to illuminate by applying alternating current voltage between its electrodes.

3. A dial as claimed in claim 2 and wherein each group of indicia relates to a different wave-band and at any one time only that group which relates to a selected wave-band is fed with an alternating current voltage.

4. A dial as claimed in any of the above claims and wherein the individual symbols of the indicia are connected to a common bus bar in the form of a straight wire running across the dial.

5. A dial as claimed in claim 4 and wherein a dark pointer is arranged above the dial to intercept the straight wire which lights up in use to form a common straight base line across the dial.

6. A dial as claimed in any of claims 1 to 4 and wherein all connecting leads are optically masked.

7. In combination a plurality of dials in accordance with the preceding claims, means for moving the same to bring any chosen one of them into a position in which it can be viewed and an additional fixed electrode mounted and arranged to energise the dial for the time being in the viewable position.

8. A combination as claimed in claim 7 and wherein alternating voltage energy is fed from the said fixed electrode to one of the electrodes of the dial for the time being in the viewable position, capacitatively via interposed insulation.

9. In combination a dial as claimed in any of the preceding claims 1 to 6 and an energising oscillator therefor, said dial being connected and arranged to constitute a capacitance in the oscillatory circuit of said oscillator.

10. A heterodyne receiver including a dial and oscillator combination as claimed in claim 9 and wherein the oscillator is also the local oscillator of said heterodyne receiver.

11. A tuning range switchable heterodyne receiver including a dial and oscillator combination as claimed in claim 9 wherein the dial is in a plurality of parts, one for each range, each part providing a different predetermined capacitance so dimensioned as to be adapted to impart to the local oscillator circuit a resonant frequency suited to the range for which the part in question is to act as a tuning indicator, means for switching the different dial-capacitances individually into said oscillator circuit to establish the different

individual tuning ranges, and a variable tuning indicator in said circuit.

12. Illuminated dials and receivers including the same substantially as herein described
5 with reference to the accompanying drawings.

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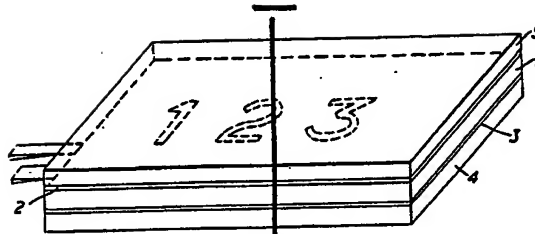


FIG. 1.

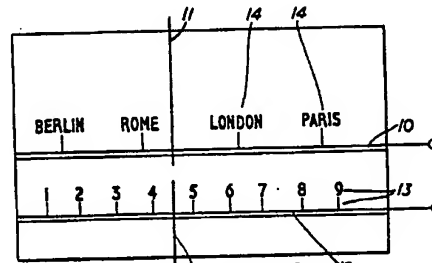


FIG. 2.

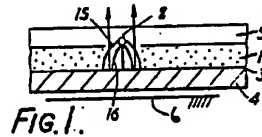


FIG. 1.

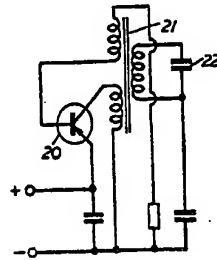


FIG. 3.